Number 1, March 1984

Development of the red maple understory in northeastern oak forests ..... *Craig G. Lorimer* 3

Ecosystem effects of Sitka alder in a Douglas-fir plantation ..... *Dan Binkley, J. Daniel Lousier, Kermit Cromack, Jr.* 26

Testing volume equation accuracy with water displacement techniques ..... *A. Jeff Martin* 41

A general procedure for sampling and analyzing wildland fire spread ..... *Albert J. Simard, James E. Eenigenburg, Kenneth B. Adams, Roger L. Nissen, Jr., Arthur G. Deacon* 51

Predicting scenic quality for urban forests using vegetation measurements ..... *Gregory J. Buhyoff, Laureen J. Gauthier, J. Douglas Wellman* 71

Compatible cubic volume and basal area projection equations for thinned old-field loblolly pine plantations ..... *Harold E. Burkhart, Peter T. Sprinz* 86

Effects of the herbicide glyphosate on bird community structure, western Oregon ..... *Michael L. Morrison, E. Charles Meslow* 95

An econometric analysis of the market for pulpwood harvested in Michigan's Upper Peninsula ..... *Thomas E. Merz* 107

Young stand development in coastal western hemlock as influenced by three harvesting regimes ..... *Larry L. Jaeck, Chadwick Dearing Oliver, Dean S. DeBell* 117

A segmented distribution approach for modeling diameter frequency data ..... *Quang V. Cao, Harold E. Burkhart* 129

Climate and the southern pine beetle in Atlantic Coastal and Piedmont regions ..... *Patrick J. Michaels* 143

A new look at sampling with partial replacement ..... *Charles T. Scott* 157

Solving and interpreting large-scale harvest scheduling problems by duality and decomposition ..... *Peter Berck, Thomas Bible* 173

The effect of a prescribed burn in southwestern ponderosa pine on organic matter and nutrients in woody debris and forest floor ..... *W. Wallace Covington, Stephen S. Sackett* 183

Econometric versus univariate and bivariate time-series forecasts: the case of softwood lumber imports ..... *Joseph Buongiorno, Lance Brannman, Taeho Bark* 194

Past tree spacing levels estimated by current stand conditions and past radial growth rates ..... *Hans R. Zuuring, Steven D. Tesch, James L. Faurot* 209

A simulation approach for optimal timber management scheduling ..... *Howard M. Hoganson, Dietmar W. Rose* 220

Vegetation/land cover mapping of the Middle Fork of the Feather River watershed using Landsat digital data ..... *Siamak Khorram, Edwin F. Katibah* 248

Notes

Effect of a prescribed fire on herbage production in southwestern ponderosa pine on sedimentary soils ..... *Brian P. Oswald and W. Wallace Covington* 22

Growth and nutrient requirements in a teak plantation age series in Nigeria. II. Nutrient accumulation and minimum annual requirements ..... *L. Chelunor Nwoboshi* 35

Principal components analysis of total tree form in seven central Pennsylvania hardwood species ..... *Jeffrey A. Newcomer and Wayne L. Myers* 64

Implementing optimal thinning strategies ..... *Kurt Riitters and J. Douglas Brodie* 82

Carbohydrate and nitrogen concentrations in leaves of three shrub species following microwave, autoclave, and air-drying treatments ..... *A. R. Tiedemann, E. D. McArthur, and C. F. Lopez* 113

Effects of nitrogen fertilization and *Pisolithus tinctorius* on *Quercus rubra* seedling root and top development ..... *Peter R. Beckjord, David Wm. Smith, and Marla S. McIntosh* 124

Root diseases cause severe mortality in white and grand fir stands of the Pacific Northwest ..... *Gregory M. Filip and Donald J. Goheen* 138

A general taper functional form to predict bole volume for five mixed-conifer species in California ..... *Elliot L. Amidon* 166

Dendrochronology of a fire-scarred ponderosa pine ..... *John H. Dieterich and Thomas W. Swetnam* 238

Douglas-fir stem growth per unit of leaf area increased by interplanted Sitka alder and red alder ..... *Dan Binkley* 259

Prediction of mid-term from short-term fertilizer responses for southern pine plantations ..... *Robert C. McNeil, Russell Ballard, and Howard W. Duzan, Jr.* 264

Number 1, March 1984

Development of the red maple understory in northeastern oak forests ..... *Craig G. Lorimer* 3

Ecosystem effects of Sitka alder in a Douglas-fir plantation ..... *Dan Binkley, J. Daniel Lousier, Kermit Cromack, Jr.* 26

Testing volume equation accuracy with water displacement techniques ..... *A. Jeff Martin* 41

A general procedure for sampling and analyzing wildland fire spread ..... *Albert J. Simard, James E. Eenigenburg, Kenneth B. Adams, Roger L. Nissen, Jr., Arthur G. Deacon* 51

Predicting scenic quality for urban forests using vegetation measurements ..... *Gregory J. Buhyoff, Laureen J. Gauthier, J. Douglas Wellman* 71

Compatible cubic volume and basal area projection equations for thinned old-field loblolly pine plantations ..... *Harold E. Burkhart, Peter T. Sprinz* 86

Effects of the herbicide glyphosate on bird community structure, western Oregon ..... *Michael L. Morrison, E. Charles Meslow* 95

An econometric analysis of the market for pulpwood harvested in Michigan's Upper Peninsula ..... *Thomas E. Merz* 107

Young stand development in coastal western hemlock as influenced by three harvesting regimes ..... *Larry L. Jaeck, Chadwick Dearing Oliver, Dean S. DeBell* 117

A segmented distribution approach for modeling diameter frequency data ..... *Quang V. Cao, Harold E. Burkhart* 129

Climate and the southern pine beetle in Atlantic Coastal and Piedmont regions ..... *Patrick J. Michaels* 143

A new look at sampling with partial replacement ..... *Charles T. Scott* 157

Solving and interpreting large-scale harvest scheduling problems by duality and decomposition ..... *Peter Berck, Thomas Bible* 173

The effect of a prescribed burn in southwestern ponderosa pine on organic matter and nutrients in woody debris and forest floor ..... *W. Wallace Covington, Stephen S. Sackett* 183

Econometric versus univariate and bivariate time-series forecasts: the case of softwood lumber imports ..... *Joseph Buongiorno, Lance Brannman, Taeho Bark* 194

Past tree spacing levels estimated by current stand conditions and past radial growth rates ..... *Hans R. Zuuring, Steven D. Tesch, James L. Faurot* 209

A simulation approach for optimal timber management scheduling ..... *Howard M. Hoganson, Dietmar W. Rose* 220

Vegetation/land cover mapping of the Middle Fork of the Feather River watershed using Landsat digital data ..... *Siamak Khorram, Edwin F. Katibah* 248

Notes

Effect of a prescribed fire on herbage production in southwestern ponderosa pine on sedimentary soils ..... *Brian P. Oswald and W. Wallace Covington* 22

Growth and nutrient requirements in a teak plantation age series in Nigeria. II. Nutrient accumulation and minimum annual requirements ..... *L. Chelunor Nwoboshi* 35

Principal components analysis of total tree form in seven central Pennsylvania hardwood species ..... *Jeffrey A. Newcomer and Wayne L. Myers* 64

Implementing optimal thinning strategies ..... *Kurt Riitters and J. Douglas Brodie* 82

Carbohydrate and nitrogen concentrations in leaves of three shrub species following microwave, autoclave, and air-drying treatments ..... *A. R. Tiedemann, E. D. McArthur, and C. F. Lopez* 113

Effects of nitrogen fertilization and *Pisolithus tinctorius* on *Quercus rubra* seedling root and top development ..... *Peter R. Beckjord, David Wm. Smith, and Marla S. McIntosh* 124

Root diseases cause severe mortality in white and grand fir stands of the Pacific Northwest ..... *Gregory M. Filip and Donald J. Goheen* 138

A general taper functional form to predict bole volume for five mixed-conifer species in California ..... *Elliot L. Amidon* 166

Dendrochronology of a fire-scarred ponderosa pine ..... *John H. Dieterich and Thomas W. Swetnam* 238

Douglas-fir stem growth per unit of leaf area increased by interplanted Sitka alder and red alder ..... *Dan Binkley* 259

Prediction of mid-term from short-term fertilizer responses for southern pine plantations ..... *Robert C. McNeil, Russell Ballard, and Howard W. Duzan, Jr.* 264

Identifying mixed-oak stand susceptibility to gypsy moth defoliation: an update ..... *Harry T. Valentine and David R. Houston* 270

Reviews
- Pinus oocarpa. An annotated bibliography ..... *Reviewed by William K. Ferrell* 2
- Forest measurements. Third edition ..... *Reviewed by David W. Hann* 93
- Plant propagation: principles and practices ..... *Reviewed by W. M. Proebsting* 156
- The gypsy moth: research toward integrated pest management ..... *Reviewed by Fred P. Hain* 171
- Improvement of forest biomass ..... *Reviewed by William R. Bentley* 192
- Governmental intervention, social needs, and the management of U.S. forests ..... *Reviewed by John A. Zivnuska* 218

Errata 2

Number 2, June 1984

The possibility of tree selection and breeding for genetic improvement of wood properties of *Gmelina arborea* ..... *A. E. Akachuku* 275

Daminozide and ethephon effects on growth of red maple and white pine on cleared sites ..... *Raymond M. See, Chester L. Foy* 291

Describing and testing nonlinear treatment effects in paired watershed experiments ..... *Benee F. Swindel, James E. Douglass* 305

Genetic structure in loblolly pine stands: allozyme variation in parents and progeny ..... *James H. Roberds, M. Thompson Conkle* 319

Sampling and estimation of conifer mortality using large-scale color aerial photography ..... *David A. Hamilton, Jr.* 333

Pre-severance environmental conditions influence rooting response of eastern white pine needle fascicles ..... *Daniel K. Struve, Frank A. Blazich* 343

Variation in the surface area relationships of loblolly pine fascicles ..... *M. G. Shelton, G. L. Switzer* 355

Inoculation of three *Quercus* species with eleven isolates of ectomycorrhizal fungi. I. Inoculation success and seedling growth relationships ..... *R. K. Dixon, H. E. Garrett, G. S. Cox, D. H. Marx, I. L. Sander* 364

Establishing southern pine beetle hazard from aerial stand data and historical records ..... *Garland N. Mason, Charles M. Bryant V* 375

Fuelwood consumption: a cross-country comparison ..... *Jan G. Laarman, Michael K. Wohlgenant* 383

Biomass and nutrient content of a 41-year-old loblolly pine (*Pinus taeda* L.) plantation on a poor site in South Carolina ..... *David H. Van Lear, Jack B. Waide, Michael J. Teuke* 395

Slash pine site index from a polymorphic model by joining (splining) nonpolynomial segments with an algebraic difference method ..... *B. E. Borders, R. L. Bailey, K. D. Ware* 411

Forests, floods, and erosion: a watershed experiment in the southeastern Piedmont ..... *John D. Hewlett, Ray Doss* 424

Nonlinear regressions and contour plots: techniques for selection and transfer of white ash provenances ..... *Knud E. Clausen* 441

Estimating the error in model predictions ..... *Marion R. Reynolds, Jr.* 454

The reliability of selected morphological characteristics in identifying *Carya* × *lecontei* through controlled-pollination experiments ..... *A. F. Stauder III, J. R. Toliver, N. Keith* 475

Tree growth responses to flooding in a bottomland forest in northeastern Illinois ..... *William J. Mitsch, William G. Rust* 499

A timber harvesting model with variable rotation lengths ..... *Ian W. Hardie, Julie N. Daberkow, Kenneth E. McConnell* 511

Symbiotic nitrogen fixation in regenerating black locust (*Robinia pseudoacacia* L.) stands ..... *Lindsay R. Boring, Wayne T. Swank* 528

Seasonal changes of tissue-water relations in shoots and root systems of Douglas-fir seedlings ..... *Gary A. Ritchie, Robert G. Shula* 538

Notes
- Crown shadow area equations ..... *Robert H. Knapp, Jr., and Richard L. Williamson* 284
- Inoculum potential of ectomycorrhizal fungi in forest soils of southwest Oregon and northern California ..... *Jennifer L. Parke, R. G. Linderman, and J. M. Trappe* 300

Importance of genotype on the potential for *in vitro* adventitious bud production of *Picea abies* ... *Sara von Arnold* 314
A simple algorithm for moment-based recovery of Weibull distribution parameters ... *Thomas E. Burk and James D. Newberry* 329
Biomass accumulation by single- and multiple-stemmed young sycamore ... *John K. Francis* 372
Rooting of tamarack cuttings ... *Katherine K. Carter* 392
Response of *Populus* hybrids to aluminum toxicity ... *K. C. Steiner, J. R. Barbour, and L. H. McCormick* 404
Flight characteristics and dispersal potential of maple samaras ... *Raymond P. Guries and Erik V. Nordheim* 434
Calculated nondestructive indices of growth response for young pine seedlings ... *J. L. Ruehle, D. H. Marx, and H. D. Muse* 469
Estimation in multiphase designs for stratification ... *Sakthivel Jeyaratnam, David C. Bowden, Franklin A. Graybill, and Warren E. Frayer* 484
Early intensive culture affects long-term growth of loblolly pine trees ... *R. C. Schmidtling* 491
Biomass prediction equations for seedlings, sprouts, and saplings of ten central hardwood species ... *R. A. Williams and J. R. McClenahen* 523
The pinning method for marking xylem growth in hardwood species ... *K. Kuroda and K. Shimaji* 548

Reviews
Measuring trees and forests: a textbook written for students in Africa ... *Reviewed by G. M. Allen* 274
Timber management: a quantitative approach ... *Reviewed by Darius M. Adams and David W. Hann* 559
Manuscript reviewers, 1983 ... 544

Number 3, September 1984

Inoculation of three *Quercus* species with eleven isolates of ectomycorrhizal fungi. II. Foliar nutrient content and isolate effectiveness ... *R. J. Mitchell, G. S. Cox, R. K. Dixon, H. E. Garrett, I. L. Sander* 563
Determining initial values for parameters of a Weibull model: a case study ... *Albert G. Krug, Erik V. Nordheim, Ronald L. Giese* 573
Severity and frequency of SO_2-induced leaf necrosis on seedlings of 57 tree species ... *D. M. Umbach, D. D. Davis* 587
A spruce budworm-forest model and its implications for suppression programs ... *Jery R. Stedinger* 597
A model for basal area distribution in loblolly pine ... *Edwin J. Green, Harold E. Burkhart, Terry R. Clason* 617
Needle-air temperature differences of Douglas-fir seedlings and relation to microclimate ... *J. A. Vanderwaal, H. R. Holbo* 635
Relationship of environmental stress and *Cytospora chrysosperma* infection to spring dieback of poplar shoots ... *Dali Tao, Paul H. Li, John V. Carter, Michael E. Ostry* 645
Gravel and grass surfacing reduces soil loss from mountain roads ... *L. W. Swift, Jr.* 657
Subsampling trees for biomass, volume, or mineral content ... *Harry T. Valentine, Louise M. Tritton, George M. Furnival* 673
Economic impacts of structural particleboard research ... *David N. Bengston* 685
Growth and physiology of loblolly pine roots under various water table level and phosphorus treatments ... *D. S. DeBell, D. D. Hook, W. H. McKee, Jr., J. L. Askew* 705
A photographic technique for use with stem analysis ... *Greg S. Biging, Lee C. Wensel* 715
A comparison of competition measures and growth models for predicting plantation red pine diameter and height growth ... *George L. Martin, Alan R. Ek* 731
Evaluation of herbicides for use in transplanting *Leucaena leucocephala* and *Prosopis alba* on semi-arid lands without irrigation ... *Peter Felker, Dom Smith, Morgan Smith, R. L. Bingham, Isidro Reyes* 747
The nature and uses of the timber production function: *Eucalyptus grandis* in Brazil ... *J. C. Nautiyal, Laercio Couto* 761
Valuation of certain long-term timber cutting contracts ... *Robert M. Shaffer, Jr.* 774

A variational solution technique for determining optimal thinning and rotational schedules ..... *David C. Cawrse, David R. Betters, Brian M. Kent* 793
Alternative estimators for point-Poisson sampling ..... *H. T. Schreuder, G. E. Brink, R. L. Wilson* 803
An improved estimator for merchantable basal area growth based on point samples ..... *James W. Flewelling, Charles E. Thomas* 813
Effects of fertilization on the growth and mycorrhizal development of container-grown jack pine seedlings ..... *R. M. Danielson, C. L. Griffiths, D. Parkinson* 828

Notes

Response of silver maple seedlings to an acute dose of root applied cadmium ..... *Gretchen C. Smith and Eileen Brennan* 582
Effects of cold soil on water relations and spring growth of Douglas-fir seedlings ..... *William Lopushinsky and Merrill R. Kaufmann* 628
Model-based sampling versus point-Poisson sampling on a timber sale in the Roosevelt National Forest in Colorado ..... *Hans T. Schreuder, Glen E. Brink, Daniel I. Schroeder, and Richard Dieckman* 652
Germination characteristics of red maple in northwestern Ontario ..... *R. E. Farmer and J. C. Goelz* 670
Some mensurational formulas associated with balanced diameter distributions ..... *Roger C. Chapman and Donald J. Weatherhead* 682
Impact of cost-share programs on private reforestation investment ..... *J. E. de Steiguer* 697
Shoot growth models for Douglas-fir and grand fir ..... *R. C. Beckwith and W. P. Kemp* 743
Techniques for distinguishing the sapwood-heartwood boundary in living lob-lolly pine (*Pinus taeda* L.) ..... *C. A. Blanch, T. E. Nebeker, J. J. Schmitt, and J. D. Hodges* 756
Dynamics of aeciospore inoculum production by *Cronartium quercuum* f. sp. *fusiforme* on slash pine ..... *Arthur H. Chappelka III, Robert A. Schmidt, and Harvey D. Patterson* 787
Trends in genetic control of juvenile black walnut height growth ..... *George Rink* 821
Approximating the precision of the parameter estimates of a nonlinear model prior to sampling ..... *George Z. Gertner* 836
Comparative susceptibility of corkbark fir and Douglas-fir to Douglas-fir dwarf mistletoe ..... *Robert L. Mathiasen* 842

Reviews

The role of fire in northern circumpolar ecosystems. Scope 18 ..... *Reviewed by William H. Romme* 615
Fire and the Australian biota ..... *Reviewed by Philip N. Omi* 730
Sclerroderris canker of conifers ..... *Reviewed by W. A. Sinclair* 848

Announcements

National wilderness research conference: an interdisciplinary meeting, July 23–26, 1985 562
Bibliographies available—Acid rain; Trees and salt 644

Forest Science Monograph 25: Commercial vegetative inoculum of *Pisolithus tinctorius* and inoculation techniques for development of ectomycorrhizae on bare-root tree seedlings. By D. H. Marx, C. E. Cordell, D. S. Kenney, J. G. Mexal, J. D. Artman, J. W. Riffle, and R. J. Molina. (Mailed concurrently with this issue of *Forest Science* as a separate.)

Number 4, December 1984

Localizing a diameter increment model with a sequential Bayesian procedure ..... *George Z. Gertner* 851
Volume and value prediction for young-growth true fir trees ..... *S. Ernst, D. W. Hann* 871
Sampling the western spruce budworm: fourth instars, pupae, and egg masses ..... *Nilima Srivastava, Robert W. Campbell, Torolf R. Torgersen, Roy C. Beckwith* 883
Development of *Pisolithus tinctorius* ectomycorrhizae on pine seedlings using basidiospore-encapsulated seeds ..... *Donald H. Marx, Kurt Jarl, John L. Ruehle, Wayne Bell* 897

A rapid technique for estimating total surface area of pine needles ..... *Jon D. Johnson* 913
An analysis and models of basal area growth in 45-year-old unthinned and thinned slash pine plantation plots ..... *Leon V. Pienaar, Barry D. Shiver* 933
Height growth and site index curves for inland Douglas-fir based on stem analysis data and forest habitat type ..... *Robert A. Monserud* 943
Compatible stem taper and volume ratio equations ..... *David D. Reed, Edwin J. Green* 977
A comparison of approaches for predicting multiple-product yields from weight-scaling data ..... *Ralph L. Amateis, Harold E. Burkhart, Brian J. Greber, E. Eric Watson* 991
Carbohydrate distribution in dormant *Populus* shoots and hardwood cuttings ..... *Anne S. Fege, Gregory N. Brown* 999
Root, shoot, and leaf area growth potentials of northern red oak planting stock ..... *Paul S. Johnson, Sandra L. Novinger, William G. Mares* 1017
An econometric study of the U.S. hardwood lumber market ..... *William G. Luppold* 1027
Evaluating the adequacy of a fire-danger rating network ..... *R. William Furman* 1045
The effect of planting density on dominant height in unthinned slash pine plantations ..... *Leon V. Pienaar, Barry D. Shiver* 1059
Dwarf mistletoe and cytospora canker decrease grand fir growth in central Oregon ..... *Gregory M. Filip* 1071
Measurement of scenic beauty: the law of comparative judgment and scenic beauty estimation procedures ..... *R. Bruce Hull IV, Gregory J. Buhyoff, Terry C. Daniel* 1084
Taper equations for second-growth mixed conifers of northern California ..... *Greg S. Biging* 1103

Notes

Attack on black walnut trees by the ambrosia beetle *Xylosandrus germanus* (Coleoptera: Scolytidae) ..... *B. C. Weber and J. E. McPherson* 864
Evidence for ectomycorrhizal fungus-mediated nutrient transfer between *Pinus* and *Tradescantia* ..... *Ruth A. Taber and Willard A. Taber* 892
Exponential diameter distribution: interpretation of coefficients ..... *Boris Zeide* 907
Optimal stocking levels and rotation under uncertainty ..... *Chiang Kao* 921
A market-share model to assess price competitiveness of softwood lumber exports to Caribbean markets ..... *Sergio Castillo M. and Jan G. Laarman* 928
The determination of percentages of living tissue in woody fine root samples using triphenyltetrazolium chloride ..... *J. D. Joslin and G. S. Henderson* 965
Occurrence of fire scars in relation to the season and frequency of surface fires in eucalyptus forests of the Northern Territory, Australia ..... *Joe R. McBride and Henry T. Lewis* 970
Development of *Pisolithus tinctorius* ectomycorrhizae on container-grown pine seedlings as affected by fertility ..... *John L. Ruehle and Carol G. Wells* 1010
Nitrogen fixation associated with increased wood decay in Douglas-fir residue ..... *M. F. Jurgensen, M. J. Larsen, S. D. Spano, A. E. Harvey, and M. R. Gale* 1038
Chapman-Richards growth function constrained for maximum tree size ..... *Stephen R. Shifley and Gary J. Brand* 1066
Fertilization increases cone production in a 55-year-old ponderosa pine stand in central Arizona ..... *L. J. Heidmann* 1079
Internal rate of return may be used to define initial equity for composite rate-of-return analyses ..... *George B. Harpole* 1096

Author index 1118
Key-word index 1120

Announcement

18th Southern Forest Tree Improvement Conference, University of Southern Mississippi, Gulf Park, Long Beach, Mississippi, May 21–23, 1985 850